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ABSTRACT

A handbook for graduate teaching assistants (GTAs) in the Department of Mathematics at the University of Southern Mississippi is presented. General information is provided on GTA supervision, instructor absences, GTA obligations, the office and supplies, and the university's sexual harassment policy. A section on the first day of class covers: the syllabus and course policy, office hours, class roll, drop-add deadlines, class attendance, the Mathematics Learning Center, and the first day lesson. Also discussed are: preparing lessons, 21 instructional techniques, 11 essential chalkboard techniques, class discipline, grading, review sessions, 12 suggestions for composing tests, 5 suggestions for administering tests, 11 suggestions for grading tests, the university grading system, steps in the grade appeal process, evaluation of the GTA by students, and classroom observation of the GTA. Included are a sample syllabus, a sample course policy, a sample instruction appraisal form, and a sample classroom observation form. (SW)

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The materials in the Special Collection on the Training of Teaching Assistants were developed through the active efforts of numerous educators who first met at the 1986 National Conference on the Institutional Responsibilities and Responses in the Employment and Education of Teaching Assistants held at the Ohio State University. Assisted by more than 80 individuals, the committee chairs listed below were able to establish the collection which will be developed and maintained by the ERIC Clearinghouse for Higher Education. This arrangement will enable faculty members, faculty developers, administrators, TA supervisors, and graduate teaching assistants to have access to TA training materials produced by institutions across the nation.

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GTA HANDBOOK

University of Southern Mississippi

Department of Mathematics

September, 1987

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Dear Teaching Assistant:

Welcome to the Department of Mathematics! Your years here as a graduate student should be two of the most stimulating and rewarding of your academic career. We have a fine program, and a productive and caring faculty. I urge you to make the most of your opportunities to interact with these dedicated professionals.

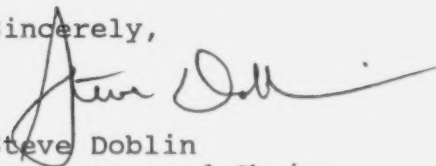
You are to be congratulated for your selection as a Graduate Teaching Assistant (GTA). Competition for our assistantships is intense, and only the most outstanding candidates are selected for this honor by the members of the Graduate Faculty. For some of you, an assistantship means only that you now have the financial support needed to obtain a graduate degree in mathematics. For others, this is actually a career transition step between student status and being a member of a college faculty. In either case, I expect you to represent this department -- and never doubt that students, parents, and members of other academic units will consider you a member of the Department of Mathematics -- with dignity and grace.

This manual has been developed for many reasons, the primary of which is that we consider what you are doing to be important, and we want you to know that there are many resources available to help you do a good job. Our GTA Handbook is designed to make your role clear, to make it easier for you to perform successfully, and to improve the quality of instruction provided to our undergraduates. College Algebra (MAT 101), which most of you will be teaching, is the University's core mathematics course. That means every student, regardless of academic major, must successfully complete this (or a higher level) math course. Hence, many of your students will have had negative experiences with algebra throughout their schooling. Others will have relatively strong math backgrounds, but will have been out of school for many years. Most will probably dislike math, and will have a certain amount of anxiety about being in your class. It is important for you to be prepared, patient, and caring. It is also important for you to help them discover the pleasure of learning and the utility of mathematics.

While your primary goal is to learn as much mathematics as possible and to obtain your Master's degree, your goal of providing your students with effective, enthusiastic, and compassionate instruction is no less important. Each of our faculty (including myself) sincerely wants you to succeed in both roles. I urge you to try to learn from all of them. In particular, the GTA Supervisor is dedicated to helping you succeed as a classroom teacher. She will meet with you on a regular basis, monitor your progress, evaluate your performance, provide you with constructive feedback, and assist you in many ways. She is a Master Teacher with many years of experience, and there is much you can learn from her.

Please feel free to come talk with me at any time. Have a good year. Good luck!

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Doblin", written in dark ink.

Steve Doblin
Professor and Chair

ACKNOWLEDGEMENTS

This handbook has been designed to be a source of information and suggestions for all graduate teaching assistants in the Department of Mathematics. It is intended to help you meet your responsibility with confidence, compassion, and enthusiasm.

Similar documents from numerous other universities were consulted while preparing the material for this handbook. The following handbooks were especially helpful: *Handbook for Teaching Assistants*, University of Delaware; *The Graduate Assistant Handbook*, University of Hawaii at Manoa; *Handbook for Graduate Assistants and Fellows*, State University of New York at Buffalo; *TAs as Teachers*, University of California at Santa Barbara; *A Handbook for Teaching Assistants*, University of Pittsburgh; *A Handbook of Resources for New Instructors* at UTK, The University of Tennessee; *Handbook*, University of New Mexico; *The Torch or the Firehose?*, Massachusetts Institute of Technology; *Manual for Teaching Assistants*, University of Missouri-Columbia; and *Handbook for Teaching Assistants at the University of Illinois*, University of Illinois at Urbana-Champaign.

Much of the information in the sections "Preparing and Presenting Lessons", "Composing Tests", and "Grading Tests" is from College Mathematics: Suggestions on How to Teach It, prepared by the Committee of Undergraduate Mathematics, Mathematical Association of America.

Alice W. Essary
Supervisor
Graduate Teaching Assistants

GENERAL INFORMATION

GTA Supervisor

The Supervisor of Graduate Teaching Assistants is Mrs. Alice Essary; Office: SH 201-B, Phone: 266-4304. It is her responsibility to train our GTAs and to evaluate the quality of their teaching. Her primary goal is to help you to become an effective undergraduate teacher. She will be happy to assist you in the teaching of your classes--lesson suggestions, teaching methods, preparation of tests, evaluating performance, assigning grades, etc. Since she will work closely with you during your time as a GTA, she will most likely be asked to write your letters of recommendation when you seek employment after graduation.

As soon as your class schedule is finalized, give the following information (in writing) to Mrs. Essary: name, local address, phone number, and class schedule.

Instructor Absences

Classes must be met at the scheduled times in the assigned classrooms. If you must be absent and know about it in advance, arrange with another GTA to conduct your class. Clear this arrangement with the GTA Supervisor, and advise the Math Department Secretary of the specifics of the situation. In the case of an emergency absence, notify the GTA Supervisor or the Math Department Secretary, so that someone can dismiss the class you will not be able to meet.

GTA Obligations

Each GTA is expected to devote 20 hours per week to assigned duties. These hours include all time spent in preparation, classroom teaching, office hours, grading papers, and attending seminars.

Office

Each GTA will be assigned a desk in SH 317. Pick up keys for your office and desk from the secretary in SH 319. When you are in your office, be considerate of your office mates who will be studying, holding conferences, grading papers, etc. Assigning all GTAs to one office provides valuable opportunities for sharing experiences, obtaining advice, discussing lesson topics, etc.

Mailbox

A mailbox in SH 317 is provided for each GTA. Please check your mailbox each day for announcements and messages.

Supplies

Supplies that are available for your use in carrying out your assigned duties include: textbook for course that you are teaching, grade book, paper, pens, pencils, paper clips, and file folders. Please be conservative in the use of all supplies. Your textbook, grade book, and keys must be turned in to the Secretary when you leave the Department.

Sexual Harassment Policy

It is the policy of the University of Southern Mississippi that no member of the university community may sexually harass another. Any employee or student will be subject to disciplinary action for violation of this policy.

Sexual harassment is illegal under both state and federal law. Vice-presidents, deans, chairs, directors, and supervisors are directed to take appropriate steps to disseminate this policy statement to inform students and employees of procedures for lodging complaints.

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when:

- (1) submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment or education;
- (2) submission to or rejection of such conduct by an individual is used as the basis for academic or employment decisions affecting that individual;
- (3) such conduct has the purpose or effect of substantially interfering with an individual's academic or professional performance or creating an intimidating, hostile or offensive employment, educational, or living environment.

Any University of Southern Mississippi employee or student having a complaint of sexual harassment should notify his/her immediate supervisor. If the complaint is against the immediate supervisor, that person's immediate supervisor should be contacted. In addition, an employee may also notify the Director of Personnel Services in Room 317, Forrest County Hall and/or the Affirmative Action Officer in Room 108, Administration Building. Students should register their complaint with the appropriate academic or administrative individual, or with the Vice President for Student Affairs in Room 100, Student Services Building, and/or the Affirmative Action Officer in Room 108, Administration Building.

The University Counseling Center staff, Room 240, Student Services Building, is available to any person who might want to discuss a sexual harassment issue.

FIRST DAY OF CLASS

Syllabus and Course Policy

To help ease first-day jitters, locate and visit the classroom assigned to you prior to the first class meeting. Determine if there might be problems with the physical conditions in the classroom, such as amount of chalkboard space, number of chairs, etc. If you have never taught before, practice writing on the chalkboard.

At the beginning of your first class meeting, introduce yourself to the class, write the course name and section number on the board (some students may be in the wrong class), and distribute the syllabus and course policy. Discussing the syllabus and policies of the class will help you to begin to establish a rapport with your students. Answer any questions that the students have about the class. If you feel comfortable doing it, you might briefly tell your class something about yourself (e.g., academic background or professional interests). You might even want to tell them that this is your first class to teach, and that you are nervous!

Your syllabus should contain at a minimum: name of course, title of text, list of sections to be covered, test dates, assignments, drop date, holidays, and date of final exam. A detailed syllabus has been prepared for each type (i.e., MWF, TT) of MAT 101 class, and is on file in the departmental office. You may make copies of this syllabus to give to your students, or you can use it to develop your own. It is important that each instructor cover the same material in each section of MAT 101. (Try to follow the syllabus as closely as possible. If you need any help in adjusting the daily lessons, see the GTA Supervisor.)

The course policy should contain at a minimum: your name, office location, phone number, office hours, grading scale, method of determining final grade, information about drop date, attendance policy, homework policy, calculator policy, make-up test policy, and information about the Math Learning Center. (A sample course policy is provided in this handbook.)

SYLLABUS

MAT 101

TT

Fall 1987

Text: College Algebra with Applications by Hall/Bennett

<u>Lesson</u>	<u>Date</u>	<u>Section</u>	<u>Assignment</u>
1	TH 8-27	2.1,2.2	
2	TU 9-1	2.2,1.5	
3	TH 9-3	1.8,2.3	
4	TU 9-8	2.3,2.4	
5	TH 9-10	Seminar	
6	TU 9-15	Test I	
7	TH 9-17	2.5	
8	TU 9-22	2.5,2.6	
9	TH 9-24	2.6	
10	TU 9-24	2.7,3.1	
11	TH 10-1	3.1,3.2	
12	TU 10-6	3.2,3.4	
13	TH 10-8	3.4,Seminar	
14	TU 10-13	Test II	
15	TH 10-15	3.5	
16	TU 10-20	3.5,3.6	
17	TH 10-22	3.6,3.7 (circle only)	
18	TU 10-27	4.1,4.2	
19	TH 10-29	4.2,Seminar	
20	TU 11-3	Test III	
21	TH 11-5	4.3,4.5	
22	TU 11-10	4.3,4.5	
23	TH 11-12	5.2,6.1	
24	TU 11-17	6.1	
25	TH 11-19	Seminar	
26	TU 11-24	Test IV	
	THANKSGIVING HOLIDAYS		
27	TU 12-1	6.2	
28	TH 12-3	6.3,6.5	
29	TU 12-8	Seminar	

FINAL EXAM:

COURSE POLICY

INSTRUCTOR:	OFFICE:	PHONE:
GRADING SCALE: 90-100 A	4 Tests	OFFICE HOURS:
80- 89 B	1 Final	
	(comprehensive)	
70- 79 C		
60- 69 D	$\text{Sum} \div 5 = \text{Final Grade}$	(other times by appointment)

The drop date for this semester is _____. After this date, it will not be possible to change the grade option or withdraw (passing or failing) from class. The only exception will be withdrawal from the University (all classes).

Class attendance is extremely important. A seating chart will be made on the second day of class, and attendance will be checked daily. Students are expected to attend all classes. If you do miss a class, it is your responsibility to obtain class notes from a classmate, find out adjustments to the syllabus, and have completed all assignments when you return to class.

Calculators may be used in class and on tests.

NO MAKE-UP TESTS WILL BE GIVEN. If a test date conflicts with a University-approved activity, see me in advance to arrange an alternate, earlier test time.

To Be Successful in This Class:

1. Before each class meeting, read the section in the book. A syllabus containing dates and assignments has been provided to you. "Seminar" means a day to catch up and review previous lessons and/or prepare for tests.
2. Attend every class. Be on time and be prepared to concentrate on and participate in the presentation.
3. Take notes in class in a specific notebook for use in MAT 101. Work practice problems assigned in class and homework problems in this notebook.
4. Try to work all homework problems before the next class and mark the ones you need to ask about. University students are expected to work all problems assigned despite the fact that homework problems are usually not handed in. Your grade on tests (and in this course) will be directly related to the amount of homework you have done.
5. Go to the Math Learning Center for help. The MLC is located in SH 205. Tutors are available to answer your questions. Hours: 8:00 a.m. - 9:00 p.m. MTWT; 8:00 a.m. - 2:30 p.m. Fridays.
6. Study in advance for tests. (Not just the night before.)

MATHEMATICS IS NOT A SPECTATOR SPORT! You must practice to learn!

Office Hours

As a GTA, you are required to schedule at least three hours a week for office hours. It is a good idea to vary the hours, such as: Monday 2:00-3:00; Tuesday 10:00-11:00; Friday 1:00-2:00. A student with a sixth period class could never meet with you during your office hours if they were scheduled for 1:00-2:00 on MWF. Be sure to be in your office during your scheduled office hours! In addition, make yourself available by special appointment to those students who cannot come at your scheduled times.

Office hours can be used to discuss grades, clarify concepts taught in the lesson, answer questions about homework problems, etc. If students need additional help with homework, refer them to the Math Learning Center.

Encourage students to come to your office for help with course material. A comment on a test or homework paper like, "I need to see you about this", might motivate a student to schedule an appointment with you. When students do come to your office for help, make them feel welcome. Create a pleasant atmosphere. Listen attentively and respond to their questions and comments in a positive manner. A good way to demonstrate that you are indeed listening is to summarize their statements/questions and to ask your own questions. Make each student feel that he/she is important and is not wasting your time.

If a student appears to need personal counseling which you do not feel qualified to give, suggest someone that they might talk to. The University Counseling Center provides to all students free services with regard to personal, social, and academic problems.

Class Roll

A computer listing of the students who are enrolled in your course will be available before the first class meeting. Be sure to check attendance the first day. A good way to do this is to have a form prepared for students to complete. This form should be designed to provide you with the following information: name, social security number, local address, local phone, major, classification, and mathematical background (high school and college courses completed).

Most likely, there will be students who attend your first class who are not registered for the course. If they plan to add your course, and if seating space is available, allow them to stay in the class. It is important that they do not miss the first class meeting. If there is not enough seating space for everyone, the non-registered students must leave. Suggest that they go by the departmental office to try to enroll in another section of College Algebra.

After the drop date, you will receive a class roster which must be returned to the Registrar's Office. On it you will note the names of all students who appear on the list but are not attending class. You should also add the names of students who are attending class but whose names are not on the list. There will be an asterisk by the name of each freshman in your class. You must report a mid-term grade for them.

Drop - Add Deadlines

Students may add a class prior to the "add deadline" (usually the end of the first week of classes) if the section is not full. After that time, the permission of the instructor is required. Do not allow students to register for your section unless you have checked with the Math Department Office. The secretary has the information needed to make a decision on increasing class size (size of classroom, number of students who have dropped, etc.). Allowing a student to enter class after the add deadline, indicates a willingness on the part of the instructor to help the student make up lessons and assignments that have been missed.

Emphasize the drop process to your students. A class may be dropped prior to the "drop deadline" without securing permission from anyone. However, some students do not realize that they will receive a grade of F or X if they merely stop attending class without officially withdrawing through the Registrar's Office. You might want to call or mail a note to any student who attends class a few times and then disappears.

Class Attendance

Check attendance each day. This process emphasizes to the student that attending class is important. A seating chart is an excellent way to check attendance, and it helps you learn the students' names. Use the chart while students are working a problem or taking notes, so that you do not waste class time by calling out names. Passing around a sheet of paper for each person to sign is distracting and often turns out to be inaccurate in large classes. (Students sign names for classmates who are absent). Instructors are often asked to furnish attendance information to parents or the Dean of Students, so it is important to keep accurate records.

Mathematics Learning Center (MLC)

The MLC, located in Southern Hall Room 205, offers tutorial assistance to all students enrolled in pre-calculus mathematics courses. A printed schedule, listing the hours and the names of the tutors on duty, is posted on the door. (Usually, the MLC is open from 8:00 a.m. to 9:00 p.m. Monday - Thursday, and from 8:00 a.m. to 2:00 p.m. on Friday). The MLC is a place to which students may go to discuss mathematics, study, and obtain tutorial assistance. In addition, CACP computers are available for all students to use.

Please encourage your students to begin using the MLC during the first week of classes. We hope that this will improve grades, increase retention, and prevent failures.

First Day Lesson

Introductions and a discussion of the syllabus and policy should not require the entire class period. Teach a lesson the first day. This conveys the idea that class time is valuable, and capitalizes on the fact that first day excitement can be constructive. Some students decide on the basis of this first lesson whether to stay in class or move up, down, or out.

Always use the full time for the first class meeting. Dismissing a class early at its first meeting can set an undesirable tone.

PREPARING AND PRESENTING LESSONS

Preparation

Prepare before every class meeting! This does not mean that you should write out a complete program or even a detailed outline beforehand. It does mean that before each session with your students you should have a clear idea of what you wish to cover and how you wish to cover it. Do not try to lecture off the top of your head. The results can be disastrous. However, do not be an inflexible slave to your plan. If an interesting point arises unexpectedly, you should be able to grant it a short digression.

While preparing for class, look several sections ahead in the text for the sake of perspective. Prepare more material than you expect to need in an hour, but do not feel obliged to cover everything you have prepared.

In preparing a lesson, do not use the same examples that are in the book. Students can read the book outside of class. Using different examples encourages students to take notes. The Lesson Notebook provided for you contains appropriate examples that can be used.

Let homework questions provide a natural springboard for the new lesson. If you realize the homework questions are taking up too much time, let the last question lead directly into the lesson. Tell students in advance that you will answer questions in your office outside of class if class time does not permit answering all questions. Sometimes a homework folder or solutions manual, with complete solutions, is provided in the teacher's office for students to use.

Avoid lecturing for more than a short period if at all possible. After presenting a new concept and working some examples, let the students practice by working a problem. This helps them realize whether or not they really understand what you are teaching.

Instructional Techniques

Here are some specific suggestions for conducting the class.

1. Arrive promptly in your classroom, preferably a minute or two before the scheduled time of the lecture.

This allows you to take care of preliminaries such as returning homework.

2. Look the students in the eye.

Eye contact should be made with each student during the lecture. This personalizes the lecture and makes each student feel more involved. Every teacher wants to establish rapport with his or her class, but it is amazing how many instructors give their lucid explanations to the blackboard, the walls, a window, or a point about one foot over the student's heads.

Non-verbal messages in the classroom provide instantaneous feedback which can be valuable to the instructor. The perceptive teacher who looks at students while lecturing can hardly miss signs of puzzlement, boredom, or understanding on their faces. Be observant and let these non-verbal signs help you become a better teacher.

3. Speak clearly, distinctly, and in a voice loud enough to be heard by everyone.

It helps to pick out one or two students and address yourself directly to them, watching their faces for signs of understanding. Of course, the same students should not always be chosen for this role.

4. Modulate your voice.

Speaking for long periods of time at the same pitch, amplitude, and speed has a tendency to put the listener to sleep. To avoid this, speak sometimes in a high voice and sometimes low, speak sometimes loud and sometimes soft, speak sometimes fast and sometimes slow.

5. It is not necessary that someone be talking every second of the class.

A pause after a sentence can give your students an opportunity to think about what you have said, and avoids the tensions a rapid-fire presentation frequently engenders. In particular, make sure that you give students in the class a fair amount of time to consider any questions that you raise. Otherwise, they tend to treat the questions as rhetorical.

6. Encourage students to ask questions. When a question is asked, make sure everyone has heard the question before proceeding.

Repeat the question if there is any doubt. This is particularly important if someone in the front of the room asks the question. Rephrase the question if you feel the original was not clear or precise. When answering a question, respond to all students, not just the asker. Other students can learn from the response. Even well-prepared students will often not ask questions for fear of appearing foolish before their classmates.

7. Encourage conjectures and do not ridicule inept questions or wrong answers.

Give students the feeling that they are all on an equal footing in your esteem. You (and they) can learn from their mistakes. Above all, avoid sarcasm in any form. Nothing can damage your relationship with a class faster than sarcasm, however warranted it may seem.

Sometimes an embarrassing situation occurs when some students laugh because they consider a question which has been asked by a student to be ridiculous. In that case, tell the class something like this: "I am sure that many of you had the same question in your minds but did not dare to ask it. Mr. Smith deserves a lot of credit for having had the courage to ask this question and thereby giving all of us the opportunity to discuss it." Then proceed to answer the question.

Instead of asking, "Does everybody understand this?" or "Are there any questions?", you might ask, "Who would like for me to discuss this some more?" A student can respond to this question by a raised hand. To indicate that something is not understood seems worse than to indicate more discussion is needed.

8. Listen to your students!

When someone volunteers an answer to one of your questions, you may realize that the approach is incorrect. Resist the urge to interrupt. Instead, try to understand what is being said, acknowledge any merit in it, determine the misconceptions, and tactfully point them out. Then let the student try again, or give someone else a chance. Many instructors misinterpret a question before it is completely formulated. After you have tried to answer a question, ask whether the student is satisfied with your response. You should realize that a seemingly "off the wall" answer may indeed be the correct one, but to a different (and equally important) question.

9. Strive for as much informality in the classroom as your own personality and the circumstances will allow.

Studies have shown that students usually perceive teachers who conduct an informal class as actually smarter and more knowledgeable in the subject than those who are stiffer and more formal. This impression is certainly often erroneous, but it has to be reckoned with. At any rate, informal give-and-take can be more pleasing for both you and your students. An overly casual, super breezy type of informality in demeanor, speech, or dress, however, should be avoided, as it does not generate either the student attitudes or the professional image best suited to a learning situation.

10. Show enthusiasm for the subject matter.

Never display boredom. Both enthusiasm and boredom are extremely communicable. Give the appearance that you enjoy teaching, and that you want to help the students enjoy learning.

11. Try to inject humor into your presentation.

Humorous anecdotes related to a specific topic almost invariably will cause the students to remember that topic much more easily.

12. Try to smile occasionally.

A smile immediately creates a positive attitude among your students, both towards you and towards the subject material being covered. A pleasant mien and a frequent smile help in establishing a congenial teacher-class relationship.

13. Never give way to anger in the classroom.

If you have a misguided, disgruntled, or possibly dyspeptic student in your class, ask this student to see you in your office. Always deal with such cases one-to-one, never in a classroom.

14. Be courteous to your students and take other steps to earn their respect.

Unfailing courtesy to students in tone and manner will elicit from them respect and courtesy that create a classroom atmosphere most conducive to learning. Take a few other simple steps to earn the respect of your students, such as not offending students by your language or dress.

15. Include interesting pieces of historical information in your lecture.

Exciting bits of information on the history and evolution of mathematical concepts or topics in your course can greatly add to the students' interest.

16. Do not be defensive when you make a mistake.

No one is perfect, and an impression of integrity is more important than an impression of omniscience. Request help from the students and correct the error together. If someone asks a question you cannot answer, do not try to cover your ignorance. Try to work out the answer with the help of the class, or promise to bring it to the next meeting (and do it). Thank those who help you find your error.

17. Interact with students.

Be aware of the feedback that students give through their facial expressions and nonverbal behavior. Respond accordingly.

18. Encourage students to take notes.

Studies show that students who take notes remember material better than those who do not. Notes, containing class examples, are helpful to students when they are working on homework and studying for tests.

19. Do whatever you do well, carefully, and completely.

It is far better to omit something than to rush your presentation, especially at the end of a lecture when the attention span of your students may already have been exhausted.

20. End your class as close to the scheduled time as possible.

Avoid keeping students late. Many of them may have another class immediately following yours, and they do not want to be late, especially if an examination is scheduled for the following class. In any event, it is almost impossible to hold students' attention in overtime.

Keep students until the bell rings. They are paying for that contact time with the teacher. For some, class time is the only time they spend working on math. If you begin with this policy, students will not get anxious to leave early. Otherwise, they will start putting their books up and getting ready to leave before you finish your lecture. Also, leaving early disturbs the other classes. If your lecture does not last the whole period, have work sheets prepared or have students work and check some even numbered problems. Or, let them begin working on homework while you walk around the room and answer questions. Also, looking at their work during class helps you see what problems they are having. If you have just a couple of minutes left, you might try to restate key points and summarize. Also, relate today's lecture to the next class or to future material.

21. Do not rush out after class.

Linger for a few minutes so that students may have an opportunity to ask questions.

Essential Chalkboard Techniques

1. Begin class with a clean board.

In math, stray lines or marks on the board may be interpreted as symbols. Adjust the shades if there is a glare on the board.

2. Write clearly, carefully, and slowly.

Writing slowly not only helps to ensure clarity, but also gives a better psychological tone to the presentation. By all means, avoid squeaking with the chalk. Breaking it in half usually stops the noise. Walk to the back of the room and take a critical look at your boardwork as if you were a student.

3. Repeat in a loud, clear voice what you are writing as you write on the chalkboard.

It may help to imagine that you have a blind student in your class.

4. Begin writing at the top of the chalkboard panel on the left, move down that panel, and then proceed to the next panel.

Avoid erasing the first panel until all available panels have been used. You should not skip around the chalkboard, placing equations haphazardly here and there. Some teachers work with eraser in hand, using it to simplify and correct as they go along. This is guaranteed to irritate students who are taking notes. Instead of revising by erasure, draw a distinct line through the offending terms and write the improved forms above them.

If you have more than two rows of students in the class and the room has a level floor, do not write all the way to the bottom of the board, because those farther back will not be able to see. You might ask students at the back how far down they can see.

5. Give students time to copy what you have written.

Stop writing when you want to analyze or discuss a point. If you move to write on the left of the board and most students are still looking at the right, stop and let them catch up.

6. Write in detail complete and precise statements of what you propose to prove or examine.

Define in writing any special symbols used in the solution. Be organized, so that students can interpret their notes later. Write on the board only the most important information. Your students' notes will consist almost entirely of what you have written on the chalkboard. Students' notes should fill, not reinforce, gaps in their recollections of a lecture. Do not write long, wordy definitions, but use symbols and formulas. Use the same notation that is used in the textbook, so that students do not have to translate material into another system of symbols. If you have trouble drawing pictures or diagrams, practice ahead of time.

7. Write solutions to problems on the board exactly as you would expect students to write them.

Solutions on the chalkboard should be considered models of solutions for students to follow. This means that you should write everything in proper form.

8. When solving a problem at the chalkboard, write a complete statement of the problem or give a precise reference.

If the problem comes from the text, write the page and problem number on the board before starting the solution. Define in writing any variables used in the solution. Unless the routine computations are prohibitively long, work the problem to completion in order to give your students practice in recognizing a solution, and to give yourself an opportunity to illustrate checking and interpreting results.

9. Important items may be emphasized by outlining them in chalk.

This is particularly true of facts you want your students to memorize. Colored chalk may help to emphasize facts or clarify drawings.

10. Do not ever write an incorrect statement on the board and tell the students that this is not correct.

The students very likely will copy the incorrect statement from the chalkboard, but fail to note your statement that it is not correct.

11. Erase the chalkboard as a courtesy to the instructor of the following class.

Discipline in Class

"The atmosphere of your classroom depends on the climate you establish as a teacher. It is important initially to demonstrate to students that learning in your classroom is a co-operative endeavor, that students as well as the instructor are contributors; so that you avoid establishing yourself as an authority figure against whom some students might feel compelled to rebel. If you proceed in a natural, calm, but also confident way, making sure that your receptivity to the students is always evident, you should be able to maintain the kind of pleasant rapport with the class that is by and large incompatible with deliberate disorder. Your confidence comes from preparing and knowing your material well, your naturalness from never putting on airs, and your calm from the knowledge you have thus given yourself that you can cope with whatever your class has to offer.

When you start to lose a class--when attention wanders or students become fidgety--it is more often a sign that something is wrong with the teaching than that something is wrong with the students. In spite of all your hard work, the lesson may be poorly prepared or poorly presented. The material may be too advanced or too basic; students may not have come as far as you thought they had or they may be way ahead of you. Or perhaps they cannot see the relevance of a particular lesson to the objectives of the course. Every teacher, even the most experienced, will have classes that fail miserably. While you could resort to ploys such as telling students that this lecture will appear on examinations so that they realize it is worth their while to listen and take notes, it would obviously be better not to have to do it. The good teacher is the one who is sensitive to his audience, quick to understand what's gone wrong, and quick to admit that it's time to stop, take stock, and start again.

In the unlikely event of a single student disrupting your class, either deliberately or inadvertently, it is very important that you remain calm. If the student is agitated or upset and the disruption is prolonged, ask him to wait and discuss the problem further with you after class. You could do this also with students who are taking up a disproportionate amount of class time to argue or to ask irrelevant questions. There are two possible ways of dealing with a student who genuinely and flatly disagrees with you: you could try and cite factual evidence to support your opinion, or, in the case of a controversial problem, admit that the student could be right. In the latter case you could reiterate why you have adopted your position so that the student has some basis for reevaluating his or hers. Such a dialogue could bring home to students the continuously organic nature of all scholarship. What you should avoid in these or any circumstances is a "snow-job," when you try to overwhelm a questioning student with an avalanche of half relevant and far too high-level comments which then discourage all further questions from your class. If, however, the problem is more serious and a student is deliberately challenging you to make you uncomfortable,

you will have to use other tactics. Wisecracks and sarcasms can be treated as though they are serious statements, or even ignored if possible. By refusing to "bite" you take the sting out of such comments.

It is extremely rare that you'd have to deal with actual unruly behavior, but in that event, you should warn the student once or twice and then, if he persists, tell him to leave. You should then report the incident to your faculty supervisor who should take any further steps necessary to settle the matter."¹

¹A Handbook for Teaching Assistants, 2nd edition, by Gillian Cannell and Ileen DeVault, Office of Faculty Development of the University of Pittsburgh, 3600 Cathedral of Learning, Pittsburgh, PA 15260.

TESTING AND GRADING

Grading

"Lecturing and other classroom activities are often seen as the fun part of teaching, while evaluating student work and assigning grades is less appealing. Unfortunately, for many students the grade is at least as important as class content.

Tests are diagnostic tools, helping students identify areas they understand and those they do not. Tests can motivate since almost all students work harder to do well on exams. Studying for tests causes students to consider, evaluate, organize, synthesize, or apply material as they prepare. Finally, tests reward students who have achieved well.

Be open, honest, and fair with students. Discuss tests both before and after they are given. If a student questions a grade, reread the paper without reference to the grade originally assigned, and attempt to determine a grade as you would have initially. If you have made a mistake, admit it and change the grade. Also offer to do things to overcome any potential harm from the incorrect grade, such as writing a letter to parents or a coach, or contacting the Veteran's Affairs or an admissions counsellor's office. If your grade agrees with the first evaluation, share with the student the basis for your evaluation. Listen to the student's interpretation and point out any flaws in logic. Keep accurate records, and retain grade records for several years. Your department may require you to leave your grade records with the department, so make sure your grading scheme is clearly indicated.

Grades are used in ways much broader than they appear immediately in a classroom context. Giving a student a "D" or an "F" may be appropriate, and may prove a sobering learning experience. Grades are not just communications between the instructor and the student, however, for they affect retention at the university, admission to graduate schools, abilities to secure employment, relationships with family and friends, self-esteem, and a host of other extra-curricular concerns. Add to this the fact that we often pack grades with other information, such as a reward for classroom participation or a penalty for a late paper or missed classes. The situation is further confused by the fact that there is no universal standard for the meaning of a "C" (or any other letter). To some a "C" indicates marginal work, barely acceptable, while to others it shows adequate, acceptable performance, but no extra initiative projects completed. Finally, the whole scheme is assigned a greater precision than it actually has by computing grade point averages to the second decimal place. The result is a seriously flawed measure with awesome weight. We cannot solve immediately the problems surrounding grades

themselves, but we can work to see that grades going into the system are as accurate and meaningful as possible."²

"You are grading only the student's work in a course, not their potential, their personalities, their general capabilities, or their character. You should be sympathetic with students' personal problems, but the final grade is not an evaluation of the problem. It is an evaluation of the student's demonstrated work in one course alone. Despite what many students believe, the grade in one course alone cannot cause a student to flunk out of school. Keeping this focus clearly in mind will relieve you of the burden of having to play God, and it will help the students to see their grades in an appropriate perspective."³

Review Session

A seminar day is usually scheduled for the class meeting immediately preceding an exam. Some of this time might be used for a review session. A good review session requires preparation and might include: a brief outline of the topics to be covered on the test, the test format, a question period, and time for students to work carefully selected practice problems.

Composing Tests

Here are some suggestions to keep in mind when you sit down to develop a test:

1. Begin by listing the main ideas, theorems and methods for which the student is held responsible, and try to cover most of them.

Do not despair if a few are missed, but it may be unfair to some students to accent one part of the material while completely neglecting others. The learning and review functions of a test should be given at least as much attention as the evaluation function.

² A Handbook of Resources for New Instructors at UTK, The University of Tennessee.

³ Manual for Teaching Assistants 1986-1987, Mathematics Department, University of Missouri, Columbia, Missouri.

2. Try to maintain a reasonable balance among "plug and grind" problems, applications, and theory.

Give an easy question or two at the beginning of the test to allow less confident students to get off to a good start. In addition, the first few questions can be used to identify particularly weak students by using questions that cover what you feel is absolutely minimum knowledge. Problems should range fairly uniformly from easy to difficult; otherwise, all the students except the very best and the very worst may get grades that do not differ significantly from one another. For the same reason, it is wise not to weight problems by difficulty. If you do intend to assign different weights to questions, this information should appear on the examination.

For example, a test might be designed so that 40% of the problems can be solved by anyone who sat in class with open eyes, another 20% can be solved by those who have done the homework routinely, 20% that are similar to harder homework problems, and finally 20% that are new (or a synthesis the students have not seen) and designed to indicate who the "A" students are.

3. Do not give students unnecessary difficulties (and excuses).

Be sure that the copy is readable and problems are clearly stated. Ideally, tests should be typed or at least reproduced legibly. Every student should have his or her own copy. It is unprofessional to write the test on the board or, worse yet, to read the test orally to students. Be sure to leave enough space for students to show their work.

Encourage questions during the examination about the interpretation of the problems, but reserve the right not to answer some questions. Try to avoid problems in which success depends too heavily on mastery of skills which it is not the purpose of the test to evaluate. Avoid long, detailed computations.

4. Construct the problems so that they resemble the ones used as class examples and the ones assigned for homework in the book.
5. Making test questions significantly interdependent is a form of double jeopardy and should be avoided.

This is as important for the convenience of the grader as for fairness to the student. For example, if problem 1 consists of determining a function satisfying prescribed conditions, then problem 2 should not involve explicit use of that function, such as calculation of its derivative or integral. If a student arrives at an incorrect solution to problem 1, the use of this solution in problem 2 might lead to great difficulty. This could make the fair assignment of partial credit difficult and could

adversely affect a student's performance on the remaining problems because of time limitations. Similarly, repetition should be avoided. Each problem should have its own purpose, and no purpose is served by having two problems test the same concept.

6. Whenever possible, avoid the use of multiple choice tests.

Although the grading of such problems becomes quick and easy, it is extremely difficult to design such a test which will fairly evaluate the state of the student's progress. Students dislike them because they often do not offer sufficient opportunity to display the extent of their knowledge. Also, a careless mistake may lead to the complete loss of points in a situation that would normally warrant substantial partial credit. Furthermore, questions of this form are not representative of the types of mathematical problems that arise in practice.

If the instructor finds that multiple choice tests are inevitable, it is still possible to give students the right to submit one or two solutions for partial credit on a separate sheet of paper. This eases student hostility to the multiple choice testing substantially, and makes the process fairer.

7. Do not ask for proofs unless students know exactly what they may assume.

Give "story problems." Make students apply definitions and work examples; avoid asking them for general definitions and theorems which merely test their ability to memorize, but not their mathematical progress. In a course like College Algebra, the important thing is whether the students understand and can use the general ideas, not whether these ideas have been learned by rote. Expect students to show their work and give reasons for what they do. Do not give full credit for unsupported correct answers unless the problem is trivial.

8. Indicate on the test the value of each problem.

9. Before a test is used, work through it carefully, using the actual form that the student will use.

It is unpleasant to discover afterward that a problem was defective, thus upsetting the students and making meaningful evaluation difficult. If you find any errors, make corrections on the original before you run off all of the tests for your class.

In determining the length of a test remember that you have certain advantages over the student: general experience, previous exposure to the problems, and probably a more relaxed state of mind. A test that takes you more than fifteen minutes to do is almost certainly too long for a fifty-minute period.

The time by which examination papers must be handed in should be clearly announced and firmly observed. It is unfair to allow some students to go on working when others must leave.

10. If your classroom is not large enough to enable students to sit in alternate seats, make out two or more forms of the test.

11. Keep a copy of the exam in your files.

Put notes in the files indicating which problems confused students or brought responses that were not intended.

12. The copy machine in SH 319-A may be used to make copies of your tests.

The Departmental Secretary will show you how to operate the machine or the office staff will copy the tests for you.

Administering Tests

1. Count the tests to be sure you have the correct number.
2. Arrive early and place tests on the desks before students come in the room. This will allow a few extra minutes for students to work on the tests, and will help keep them from becoming nervous while they wait for the test to be distributed.
3. Minimize interruptions. Write announcements, instructions, or corrections on the chalkboard at the beginning of the period.
4. Cheating will occur if the instructor seems unconcerned. Using alternate seats or different forms of the test will discourage cheating. Stay in the room during the test. If cheating is discovered, the instructor may give the student an "F" on the work involved or in the course. You might want to consult the GTA Supervisor or the Departmental Chairman before acting.
5. Final Exams will be held as published in the schedule of classes. No final exams are permitted prior to the scheduled examination period. A student who is absent from the final exam without a valid reason approved by the Vice President for Academic Affairs forfeits credit for the semester.

Grading Tests

1. Grade and return examination papers promptly.

Students will conclude that their class has a low priority among your activities if more than one or two periods elapse without their papers being returned. The grades, your written comments on the papers, and classroom discussion of the examination will all mean more when the students' memories of the examination and of what they were thinking when they took it are still fresh.

2. Take reasonable steps to increase the objectivity and uniformity of grading.

Ask students to sign papers in a location that will not allow you to see their names every time you pick up the papers.

3. Decide in advance how you will allocate partial credit.

Certain common mistakes can be anticipated, and if penalties for these mistakes are predetermined, grading will be more consistent.

4. Grade one problem at a time.

Shuffle the papers between problems in order to offset possible tendencies to grade the first papers differently from later ones.

5. Do not grade by the answer alone; examine the technique carefully.

Mark wrong only something which is wrong. Watch for unusual and ingenious solutions. The wrong answer does not necessarily imply the method was incorrect.

6. When you return the papers, list the grade ranges and the median grade on the blackboard.

Without this information, a student with a low score may believe that almost no one in the class performed any better on the examination. If the class is small, you may want to list all grades on the board. Perhaps letter grades corresponding to the scores should be mentioned--as tentative equivalents--to leave no ground for future complaints.

7. An examination often exposes ideas which are not yet clear to enough students.

Your last opportunity to dispel a particular misconception may come when the papers are returned, and the opportunity should not be lost. This is also a time when particularly elegant solutions by students may be shown to the class. If the examination covered some important concepts and perhaps unified several ideas, this is an opportunity to stress these matters again.

8. If time does not permit lengthy discussion of the examination, make an answer key available for students to use outside of class in your office or in the Math Learning Center.
9. Place the grade on each test at the bottom of the page, and fold the test paper so that the grade cannot be seen by students as you return the papers.
10. To save class time, arrive early when tests are to be returned. Place tests at the door and let students pick up their test as they enter the room. Have the tests arranged in alphabetical order. Alternatively, arrange tests in the order of the seating chart. Arrive early and place tests on student's desks. (This will keep latecomers from interrupting class to get their test).
11. Test scores and grades must remain confidential. No grades should be posted (in any manner) and no grades may be given over the phone.

University Grading System

- A - indicates superior work and carries 4 quality points per semester hour.
- B - indicates excellent work and carries 3 quality points per semester hour.
- C - indicates average work and carries 2 quality points per semester hour.
- D - indicates inferior work and carries 1 quality point per semester hour.
- E - indicates a course in progress. Not included in the grade point average, a grade of E shall be awarded for graduate thesis and dissertation courses and for such self-paced or skill courses as the Academic and/or Graduate Council may designate. An E shall be changed to a P or a valuative grade (A,B,C,D,F) only in the case of credit for thesis and dissertations and then only for the minimum hours required (usually 6 hours). Otherwise, the E remains on the record indicating that to receive credit the student must re-register for the undergraduate course, repeating it on a regular basis until completing it. Upon completion, the appropriate grade, whether P or valuative, shall be assigned.
- F - indicates failure and carries no quality points. A grade of F may not be removed by taking an independent study course. The grade of F will also be assigned if a student withdraws from the University after the deadline and has failing grades at the time of withdrawal.

- W - indicates withdrawal from a course while passing.
- I - indicates an incomplete record and will have no immediate impact on a student's grade point average. An I is treated as an F at the time of graduation if not removed within one term of attendance. An I may not be removed by taking an independent study course. The I grade in any course will be treated as an F if the student chooses to re-register for the course. A student who is absent from the final examination without valid reason approved by the Vice President for Academic Affairs forfeits credit for the course.
- N - indicates a failing grade in courses taken on a pass-fail basis (does not count in computing GPA).
- P - indicates a passing grade in courses taken on a pass-fail basis (does not count in computing GPA).
- X - indicates failure to drop or withdraw properly, but only before the 25th class day. It will count as an F in the student's grade point average and may not be used for a student who simply stops attending class after the drop date. Upon completion of the drop/withdrawal form and payment of the appropriate fees, the Registrar is authorized to replace the grade of X with a W.

Pass-Fail: Students may take courses either on a pass-fail basis or for a grade. The option must be exercised at the time of registration, and the option may not be altered after the deadline for adding courses. No more than thirty-six (36) semester hours earned in independent study or pass-fail courses, with a limit of eighteen (18) semester hours of pass-fail courses, may be applied toward a degree. No more than twelve (12) semester hours earned from the same department by independent study or pass-fail courses may be applied toward a degree. A student may not take a course on a pass-fail basis to repeat a course for the purpose of improving the grade point average or to remove an Incomplete. Such courses cannot be a part of a prescribed degree program; i.e., core requirements, major, or minor.

Audit: A student who takes a course for audit (non-credit) must meet the class in the same manner as a student regularly enrolled. Although no credit is awarded, a student who meets the instructor's requirements for a successful audit will receive an appropriate entry on his or her official record. The instructor has the right to remove a student from the final grade roster for non-attendance. The credit option (audit to credit or credit to audit) may not be changed after the deadline for adding courses. The fee for audit is the same as if registered for credit.

Steps in the Grade Appeal Process

1. A student who is dissatisfied with a course final grade must first attempt to negotiate a change in the grade with the instructor teaching the course. If the instructor is not a member of the University faculty at the time the student receives notice of the final grade, the student should attempt to negotiate a grade change with the chair of the department in which the course was taught.
2. Should the decision of the instructor in Step 1 be unacceptable to the student, the student should secure the University's Appeal Form for Grade Review from the Office of the Vice President for Academic Affairs and provide the information required. The student will sign and date a log. The purpose of the log is to enable the Council to monitor the accessibility and effectiveness of the grade challenge process. At the same time, the student will be assisted in scheduling an appointment with the Chair (or, if unavailable, the Vice Chair) of the Council. The student must then return to the instructor who assigned the disputed grade. The student must provide the instructor with a copy of the written summary explaining the rationale for the grade challenge, as required in item 4 of the Procedure Checklist. Additionally, the student should obtain the instructor's signature in the appropriate space on the Appeal Form for Grade Review. Whether or not the instructor signs the form, the student will take it to the chair of the instructor's department. The chair, in separate and/or joint conference with the instructor and student, shall attempt to reach an agreement for a final grade. If the instructor is the department chair, the student goes to Step 3.
3. Should the department chair be unable to resolve the matter to the satisfaction of all parties, the appeal will then be referred to the dean of the school or college in which the instructor teaches. The dean, in separate and/or joint conference with the instructor (or chair) and student, shall attempt to reach an agreement for a final grade. If the dean is the instructor, the student goes to Step 4.
4. Should the reviewing dean be unable to resolve the matter to the satisfaction of all parties in Step 3, the matter may be submitted to the Vice President for Academic Affairs, who may direct the Chair of the University Grade Review Council to consider the appeal.
5. If the grade challenge is for a grade assigned in a graduate course, copies of the signed Appeal Form for Grade Review and the Council's letter to the participants (Article VI, Section 9) will be sent by the Chair to the Dean of the Graduate School. If the grade challenge is for a grade assigned in a course taught as part of the British Studies Program, copies of the signed Appeal Form for Grade Review and the Council's

letter to the participants will be sent by the Chair to the Head of the Center for International Education.

6. The Council will hear a student's petition if thirty percent (30%) of the Council's members vote to hear the case under the criteria spelled out below. The Chair of the Council will distribute the student's appeal package to all Council members. Shortly thereafter, the Chair will call for a mail ballot by Council members to determine whether thirty percent (30%) of the members believe the case should be presented before the entire Council. All members must vote either in the affirmative or the negative to hear the case. Ballots must be signed. The criterion to which members must refer when voting whether or not to hear the case is whether the student's appeal represents an issue upon which a difference of opinion is reasonable, or whether it appears to be essentially frivolous.
7. If, after following the procedure outlined in Article V, Section 6, the membership of the Council elects not to hear a student's petition, the Chair shall so notify the complainant, the instructor, the Vice President for Academic Affairs, and the members of the Council. This notification, which must be in writing, shall indicate only that the Council will not hear the challenge because it does not fall within the Council's purview.
8. In those cases where less than thirty percent (30%) of the Council vote for a hearing, the student may appeal to the Vice President for Academic Affairs, who may convene the Council if he believes the case to have merit.

Note: The preceding is a summary of the grade challenge process. Neither the Procedure Checklist nor the Council Bylaws has been included in this material.

EVALUATION

Evaluation by Students

Student evaluations can provide useful information to help you assess your effectiveness as a teacher. If the evaluations are administered early enough (around mid-term) you will have the results in time to modify your approach/procedures (if warranted) long before the course ends. Students will be much more inclined to furnish helpful observations and suggestions if they know that the rest of their course might change for the better through your response to their constructive criticism. Use the information and insight you gain from the evaluations to improve your teaching skills.

The GTA Supervisor will administer the student evaluation instrument to your class. Students seem to feel more comfortable completing the form if the teacher is not present. After compiling the results, the supervisor will return forms to you to keep. Only the Chair of the Department and the GTA Supervisor will see the results of your evaluations.

A sample Instructor Appraisal Form is provided in this handbook. Use the statements as guidelines in setting your teaching goals.

Classroom Observation

Sometime before mid-term, the GTA Supervisor will visit your class. Your lecture will be evaluated based upon content, presentation style, and chalkboard techniques.

INSTRUCTOR APPRAISAL

MAT _____

PERIOD _____

PLEASE READ EACH STATEMENT CAREFULLY. THEN SELECT ONE OF THESE FIVE ALTERNATIVES: STRONGLY AGREE (SA), AGREE (A), UNDECIDED (U), DISAGREE (D), STRONGLY DISAGREE (SD).

The instructor:

seems well-prepared for class.	SA	A	U	D	SD
makes good use of examples and illustrations.	SA	A	U	D	SD
explains concepts clearly.	SA	A	U	D	SD
lectures in a manner which holds class attention.	SA	A	U	D	SD
gives lectures that facilitate taking notes.	SA	A	U	D	SD
does not waste class time.	SA	A	U	D	SD
encourages students to ask questions.	SA	A	U	D	SD
gives meaningful answers to student's questions.	SA	A	U	D	SD
speaks clearly and audibly.	SA	A	U	D	SD
does not have distracting mannerisms.	SA	A	U	D	SD
writes legibly on the chalkboard.	SA	A	U	D	SD
seems to enjoy teaching.	SA	A	U	D	SD
gives exams that stress important points of the lectures and text.	SA	A	U	D	SD
gives exams that are reasonable in length and difficulty.	SA	A	U	D	SD
grades and returns tests promptly.	SA	A	U	D	SD
takes measures to prevent cheating.	SA	A	U	D	SD
is accessible to students outside of class.	SA	A	U	D	SD
has a helpful attitude toward students.	SA	A	U	D	SD

has increased my interest in learning more mathematics.	SA	A	U	D	SD
I feel free to ask questions in class.	SA	A	U	D	SD
I attend class regularly.	SA	A	U	D	SD
I complete most of the homework assignments.	SA	A	U	D	SD
I take notes in class.	SA	A	U	D	SD
I would enjoy taking another course from this instructor.	SA	A	U	D	SD

PLEASE WRITE COMMENTS AND SUGGESTIONS BELOW.

CLASSROOM OBSERVATION CHECKLIST

A. Content

1. Stated the purpose of the lecture.
2. Presented brief overview of the lecture content.
3. Made known the relationship between today's and the previous lecture.
4. Was prepared for the class session. Knew the subject material.
5. Material was arranged and discussed in a systematic and organized fashion.
6. Relevant examples were used to classify difficult or major ideas.
7. Material covered at an appropriate pace.
8. Students had time to take notes.
9. Students listened attentively to lecture.
10. Student's ideas were solicited and used in class.
11. Received student questions politely and when possible enthusiastically.
12. Related new ideas to already familiar ones.
13. Stated relationships among various ideas in the lecture.
14. Provided occasional summaries and restatements of important ideas.
15. Asked questions to see what students knew about topic.
16. Paused after questions to allow students time to think of answer.
17. Asked probing questions if a student's answer was incomplete or superficial.
18. Encouraged students to answer difficult questions by providing cues on rephrasing.
19. Repeated answers so entire class could hear.
20. Related the day's lecture to future topics.
21. Class began and ended on time.

B. Presentation Style

1. Voice could be easily heard.
2. Rate of speech was neither too fast nor too slow.
3. Did not digress from the main topic.
4. Established eye contact with class.
5. Was not too stiff or formal in appearance.
6. Was not too casual in appearance.
7. Speech mannerisms were not distracting.

C. Chalkboard Techniques

1. Board work appeared organized and legible.
2. Repeated in loud voice what was being written on board.
3. Did not erase too quickly.
4. Did not stand in front of writing.
5. Identified problem number by writing it on the board.
6. Worked problems completely.
7. Erased board when class was over.